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OM protein - protein search, using sw model

Run on: March 17, 2003, 07:13:51 ; Search time 6.19847 Seconds  
(without alignments)  
194.050 Million cell updates/sec

Title: US-09-787-082-6

Perfect score: 173

Sequence: 1 CKGKAKCSRLMYDCGTGSCRSKCTRNG 29

Scoring table: BLOSUM62

Gapop 10.0 , Gapext 0.5

Searched: 112892 seqs, 41476328 residues

Total number of hits satisfying chosen parameters: 112892

Minimum DB seq length: 0

Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%

Maximum Match 100%

Listing first 45 summaries

Database : SwissProt\_40.\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

#### SUMMARIES

Result No.	Score	Query Match	Length	ID	Description
1	151	87.3	71	1	CXOA_CONMA
2	124	71.7	25	1	CXOB_CONCT
3	122.5	70.8	26	1	CXOC_CONCT
4	120	69.4	25	1	CXOD_CONMA
5	115	66.5	27	1	CX07_CONCN
6	115	66.5	71	1	CX03_CONST
7	115	66.5	71	1	CX0A_CONCT
8	114	65.9	73	1	CXOD_CONCT
9	112.5	65.0	29	1	CXOC_CONMA
10	104	60.1	29	1	CXOD_CONMA
11	97.5	56.4	72	1	CXOB_CONST
12	75.5	43.6	29	1	CX07_CONGE
13	64	37.0	72	1	MT12_MYTED
14	60.5	35.0	66	1	MT3_RAT
15	60.5	35.0	68	1	MT3_MOUSE
16	59	34.1	72	1	MT1A_MYTED
17	58	33.5	27	1	CXDB_CONTE
18	58	33.5	72	1	MT1B_MYTED
19	58	33.5	78	1	CXDA_CONTE
20	57	32.9	72	1	CXOA_CONST
21	57	32.9	72	1	MT14_MYTED
22	56.5	32.7	73	1	CX06_CONGE
23	56	32.4	72	1	CX02_CONST
24	55.5	32.1	27	1	CX06_CONRA
25	55	31.8	61	1	MT1A_HORSE
26	55	31.8	65	1	MTB_STRPU
27	55	31.8	68	1	MT3_HORSE
28	55	31.8	68	1	MT3_HUMAN
29	55	31.8	68	1	MT3_PIG
30	55	31.8	72	1	CX01_CONST
31	55	31.8	615	1	FAI2_HUMAN
32	54.5	31.5	26	1	CX06_CONTU
33	54.5	31.5	26	1	CX07_CONTE

#### RESULT 1

##### CXOA\_CONMA

ID	CXOA_CONMA	STANDARD;	PRT;	71 AA.
AC	P05484;			
DT	01-NOV-1988 (Rel. 09, Created)			
DT	15-JUN-2002 (Rel. 41, Last sequence update)			
DT	15-JUN-2002 (Rel. 41, Last annotation update)			
DE	Omega-conotoxin MVIIa precursor (SNX-111) (Ziconotide).			
OS	Conus magus (Magus cone).			
OC	Eukaryota; Metazoa; Mollusca; Gastropoda; Caenogastropoda;			
OC	Neogastropoda; Conoidea; Conidae; Conus.			
OX	NCBI_TaxID=6492;			
RN	[1]			
RP	SEQUENCE FROM N.A.			
RC	TISSUE=Venom duct;			
RX	PubMed=10938268;			
RA	Lewis R.J., Nielsen K.J., Craik D.J., Loughnan M.L., Adams D.A.,			
RA	Sharpe J.A., Luchian T., Adams D.J., Bond T., Thomas L., Jones A.,			
RA	Mateson J.-L., Drinkwater R., Andrews P.R., Alewood P.F.;			
RT	"Novel omega-conotoxins from Conus catus discriminate among neuronal			
RT	calcium channel subtypes.";			
RL	J. Biol. Chem. 275:35335-35344(2000).			
RN	[2]			
RP	SEQUENCE OF 46-70.			
RX	MEDLINE=86070213; PubMed=4071055;			
RA	Olivera B.M., Gray W.R., Zeikus R.D., McIntosh J.M., Varga J.,			
RA	Rivier J.E., de Santos V., Cruz L.J.;			
RT	"Peptide neurotoxins from fish-hunting cone snails.";			
RL	Science 230:1338-1343(1985).			
RN	[3]			
RP	SEQUENCE OF 46-70.			
RX	MEDLINE=87299637; PubMed=2441741;			
RA	Olivera B.M., Cruz L.J., de Santos V., Lechmanant G.W., Griffin D.,			
RA	Zeikus R.D., McIntosh J.M., Galyean R., Varga J., Gray W.R.,			
RA	Rivier J.E.;			
RT	"Neuronal calcium channel antagonists. Discrimination between calcium			
RT	channel subtypes using omega-conotoxin from Conus magus venom.";			
RL	Biochemistry 26:2086-2090(1987).			
RN	[4]			
RP	DISULFIDE BONDS.			
RX	PubMed=8537186;			
RA	Chung D., Gaur S., Bell J.R., Ramachandran J., Nadasdi L.;			
RT	"Determination of disulfide bridge pattern in omega-conopeptides.";			
RL	Int. J. Pept. Protein Res. 46:320-325(1995).			
RN	[5]			
RP	SYNTHESIS, AND MUTAGENESIS OF LYS-47 AND TYR-58.			
RX	PubMed=7826361;			
RA	Kim J.I., Takahashi M., Ohtake A., Wakamiya A., Sato K.;			
RT	"Tyrl3 is essential for the activity of omega-conotoxin MVIIA and			
RT	GVIa, specific N-type calcium channel blockers.";			
RL	Biochem. Biophys. Res. Commun. 206:449-454(1995).			
RN	[6]			
RP	STRUCTURE BY NMR.			
RX	MEDLINE=95367555; PubMed=7640281;			
RA	Kohno T., Kim J.-I., Kobayashi K., Kodera Y., Maeda T., Sato K.;			
RT	"Three-dimensional structure in solution of the calcium channel			

34	54.5	31.5	169	1	KRUA_HUMAN	P26371 homo sapien
35	54	31.2	61	1	MT1A_RABIT	P11957 oryctolagus
36	54	31.2	61	1	MT2B_RABIT	P80289 oryctolagus
37	54	31.2	61	1	MT2D_RABIT	P80291 oryctolagus
38	54	31.2	61	1	MT2E_RABIT	P80292 oryctolagus
39	54	31.2	863	1	AD17_DROME	Q9vac5 drosophila
40	53	30.6	30	1	CX7A_CONTU	P58923 conus tulip
41	53	30.6	64	1	MTA_STRPU	P04734 strongyloce
42	53	30.6	78	1	IBB2_PHAAN	P01061 phaseolus a
43	52.5	30.3	52	1	CTL2_NPVOU	O10286 orygia pseu
44	52.5	30.3	72	1	CXK7_CONPU	P56633 conus purpu
45	52	30.1	60	1	MT_AMBME	O42152 ambystoma m

#### ALIGNMENTS

RT blocker omega-conotoxin MVIIA.";  
 RL Biochemistry 34:10256-10263(1995).  
 RN [7]  
 RX STRUCTURE BY NMR.  
 RA PubMed=7656969;  
 RA Basus V.J., Nadasdi L., Ramachandran J., Miljanich G.P.;  
 RT "Solution structure of omega-conotoxin MVIIA using 2D NMR  
 spectroscopy.";  
 RL FEBS Lett. 370:163-169(1995).  
 RN [8]  
 RP STRUCTURE BY NMR.  
 RX MEDLINE=97070382; PubMed=8913308;  
 RA Nielsen K.J., Thomas L., Lewis R.J., Alewood P.F., Craik D.J.;  
 RT "A consensus structure for omega-conotoxins with different  
 selectivities for voltage-sensitive calcium channel subtypes:  
 comparison of MVIIA, SVIB and SNX-202.";  
 RL J. Mol. Biol. 263:297-310(1996).  
 RN [9]  
 RP STRUCTURE BY NMR.  
 RX PubMed=10373375;  
 RA Nielsen K.J., Adams D., Thomas L., Bond T., Alewood P.F., Craik D.J.,  
 Lewis R.J.;  
 RT "Structure-activity relationships of omega-conotoxins MVIIA, MVIIIC and  
 14 loop splice hybrids at N and P/Q-type calcium channels.";  
 RL J. Mol. Biol. 289:1405-1421(1999).  
 RN [10]  
 RP STRUCTURE BY NMR.  
 RX PubMed=10747778;  
 RA Atkinson R.A., Kieffer B., Dejaegere A., Sirockin F., Lefevre J.-F.;  
 RT "Structural and dynamic characterization of omega-conotoxin MVIIA: the  
 binding loop exhibits slow conformational exchange.";  
 RL Biochemistry 39:3908-3919(2000).  
 RN [11]  
 RP STRUCTURE BY NMR.  
 RX MEDLINE=21243158; PubMed=11344322;  
 RA Goldenberg D.P., Koehn R.E., Gilbert D.E., Wagner G.;  
 RT "Solution structure and backbone dynamics of an omega-conotoxin  
 precursor.";  
 RL Protein Sci. 10:538-550(2001).  
 CC -!- FUNCTION: Omega-conotoxins act at presynaptic membranes, they bind  
 and block voltage-sensitive calcium channels (VSCC). This toxin  
 blocks N-type calcium channels.  
 CC -!- SUBCELLULAR LOCATION: Secreted.  
 CC -!- TISSUE SPECIFICITY: Expressed by the venom duct.  
 CC -!- PHARMACEUTICAL: Is under clinical trial by Neurex. It blocks acute  
 pain in patients who no longer obtain relief from opiate drugs. It  
 is 100 to 1000 times more potent than morphine. By blocking  
 calcium channels it disables nerves that transmit pain signals.  
 CC -!- SIMILARITY: BELONGS TO THE O-SUPERFAMILY OF CONOTOXINS. OMEGA-TYPE  
 FAMILY.  
 CC -!- DATABASE: NAME=Ziconotide Source; NOTE=Web site on ziconotide;  
 WWW="http://docmd.com/ziconotide/".  
 DR PIR: C60133; C60133.  
 DR PIR: JH0700; JH0700.  
 DR PDB: 1OMG; 03-APR-96.  
 DR PDB: 1MVI; 12-AUG-97.  
 DR PDB: 1DW4; 01-MAR-00.  
 DR PDB: 1DW5; 01-MAR-00.  
 DR PDB: 1FEO; 23-AUG-00.  
 KW Presynaptic neurotoxin; Neurotoxin; Toxin; Calcium channel inhibitor;  
 KW Amidation; Signal; 3D-structure; Pharmaceutical.  
 FT SIGNAL 1 22  
 FT PROPEP 23 45  
 FT PEPTIDE 46 70  
 FT DISULFID 46 61  
 FT DISULFID 53 65  
 FT DISULFID 60 70  
 FT MOD\_RES 70 70  
 FT MUTAGEN 47 47  
 FT Y->A: STRONG DECREASE IN ACTIVITY.  
 SQ SEQUENCE 71 AA; 7587 MW; E2A32725C81AF31D CRC64;

Query Match

87.3%; Score 151; DB 1; Length 71;

Best Local Similarity 100.0%; Pred. No. 9.3e-12;  
 Matches 25; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
 QY 1 CKGKGAKCSRLMYDCCTGSCRSKC 25  
 DB 46 CKGKGAKCSRLMYDCCTGSCRSKC 70  
 RESULT 2  
 CXOB\_CONCT STANDARD; PRT; 25 AA.  
 ID CXOB\_CONCT  
 AC P58918;  
 DT 15-JUN-2002 (Rel. 41, Created)  
 DT 15-JUN-2002 (Rel. 41, Last sequence update)  
 DT 15-JUN-2002 (Rel. 41, Last annotation update)  
 DE Omega-conotoxin CVIB.  
 OS Conus catus (Cat cone).  
 OC Eukaryota; Metazoa; Mollusca; Gastropoda; Caenogastropoda;  
 OC Neogastropoda; Conoidea; Conidae; Conus.  
 OX NCBI\_TaxID=101291;  
 RN [1]  
 RP SEQUENCE, AND SYNTHESIS.  
 RC TISSUE=Venom;  
 RX PubMed=10938268;  
 RA Lewis R.J., Nielsen K.J., Craik D.J., Loughnan M.L., Adams D.A.,  
 Sharpe I.A., Luchian T., Adams D.J., Bond T., Thomas L., Jones A.,  
 Matheson J.-L., Drinkwater R., Andrews P.R., Alewood P.F.;  
 RT "Novel omega-conotoxins from Conus catus discriminate among neuronal  
 calcium channel subtypes.";  
 RL J. Biol. Chem. 275:35335-35344(2000).  
 CC -!- FUNCTION: Omega-conotoxins act at presynaptic membranes, they bind  
 and block voltage-sensitive calcium channels (VSCC) (By  
 similarity). This toxin blocks N-, P-, and Q-type calcium  
 channels.  
 CC -!- SUBCELLULAR LOCATION: Secreted.  
 CC -!- TISSUE SPECIFICITY: Expressed by the venom duct.  
 CC -!- SIMILARITY: BELONGS TO THE O-SUPERFAMILY OF CONOTOXINS. OMEGA-TYPE  
 FAMILY.  
 KW Presynaptic neurotoxin; Neurotoxin; Toxin; Calcium channel inhibitor;  
 KW Amidation.  
 FT DISULFID 1 16 BY SIMILARITY.  
 FT DISULFID 8 20 BY SIMILARITY.  
 FT DISULFID 15 25 BY SIMILARITY.  
 FT MOD\_RES 25 25 AMIDATION.  
 SQ SEQUENCE 25 AA; 2717 MW; D41A9E5F5AFA9552 CRC64;  
 Query Match 71.7%; Score 124; DB 1; Length 25;  
 Best Local Similarity 76.0%; Pred. No. 6.5e-09;  
 Matches 19; Conservative 2; Mismatches 4; Indels 0; Gaps 0;  
 QY 1 CKGKGAKCSRLMYDCCTGSCRSKC 25  
 DB 1 CKGKGAKCSRLMYDCCTGSCRSKC 25  
 RESULT 3  
 CXOC\_CONCT STANDARD; PRT; 26 AA.  
 ID CXOC\_CONCT  
 AC P58919;  
 DT 15-JUN-2002 (Rel. 41, Created)  
 DT 15-JUN-2002 (Rel. 41, Last sequence update)  
 DT 15-JUN-2002 (Rel. 41, Last annotation update)  
 DE Omega-conotoxin CVIC.  
 OS Conus catus (Cat cone).  
 OC Eukaryota; Metazoa; Mollusca; Gastropoda; Caenogastropoda;  
 OC Neogastropoda; Conoidea; Conidae; Conus.  
 OX NCBI\_TaxID=101291;  
 RN [1]  
 RP SEQUENCE, AND SYNTHESIS.  
 RC TISSUE=Venom;  
 RX PubMed=10938268;  
 RA Lewis R.J., Nielsen K.J., Craik D.J., Loughnan M.L., Adams D.A.,  
 Sharpe I.A., Luchian T., Adams D.J., Bond T., Thomas L., Jones A.,

RA Matheson J.-L., Drinkwater R., Andrews P.R., Alewood P.F.;  
 RT "Novel omega-conotoxins from *Conus catus* discriminate among neuronal  
 calcium channel subtypes.";  
 RL J. Biol. Chem. 275:35335-35344(2000).  
 CC -!- FUNCTION: Omega-conotoxins act at presynaptic membranes, they bind  
 CC and block voltage-sensitive calcium channels (VSCC) (By  
 CC similarity). This toxin blocks N-, P-, and Q-type calcium  
 CC channels.  
 CC -!- SUBCELLULAR LOCATION: Secreted.  
 CC -!- TISSUE SPECIFICITY: Expressed by the venom duct.  
 CC -!- SIMILARITY: BELONGS TO THE O-SUPERFAMILY OF CONOTOXINS. OMEGA-TYPE  
 CC FAMILY.  
 CC Presynaptic neurotoxin; Neurotoxin; Toxin; Calcium channel inhibitor;  
 KW Amidation.  
 FT DISULFID 1 16 BY SIMILARITY.  
 FT DISULFID 8 20 BY SIMILARITY.  
 FT DISULFID 15 26 BY SIMILARITY.  
 FT MOD\_RES 26 26 AMIDATION.  
 SQ SEQUENCE 26 AA; 2790 MW; 56EFC382335C4A8B CRC64;  
 Query Match 70.8%; Score 122.5; DB 1; Length 26;  
 Best Local Similarity 80.8%; Pred. No. 1e-08;  
 Matches 21; Conservative 1; Mismatches 3; Indels 1; Gaps 1;  
 QY 1 CKGKGAKCSRLMYDCTGSC-RSGKC 25  
 Db 1 CKGKGSCSKLMDCTGSCRRGKC 26  
 RESULT 4  
 CXOB\_CONMA STANDARD; PRT; 25 AA.  
 ID CXOB\_CONMA  
 AC P05485;  
 DT 01-NOV-1988 (Rel. 09, Created)  
 DT 01-NOV-1988 (Rel. 09, Last sequence update)  
 DT 15-JUN-2002 (Rel. 41, Last annotation update)  
 DE Omega-conotoxin MVIIB (SNX-159).  
 OS *Conus magus* (Magus cone).  
 OC Eukaryota; Metazoa; Mollusca; Gastropoda; Caenogastropoda;  
 OC Neogastropoda; Conoidea; Conidae; Conus.  
 OX NCBI\_TaxID=6492;  
 RN [1]  
 RP MEDLINE=67299637; PubMed=2441741;  
 RX Oliveira B.M., Cruz L.J., de Santos V., Lecheminant G.W., Griffin D.,  
 RA Zeikus R.D., McIntosh J.M., Galyean R., Varga J., Gray W.R.,  
 RA Rivier J.E.;  
 RT Neuronal calcium channel antagonists. Discrimination between calcium  
 RT channel subtypes using omega-conotoxin from *Conus magus* venom.";  
 RL Biochemistry 26:2086-2090(1987).  
 CC -!- FUNCTION: Omega-conotoxins act at presynaptic membranes, they bind  
 CC and block voltage-sensitive calcium channels (VSCC).  
 CC -!- SUBCELLULAR LOCATION: Secreted.  
 CC -!- TISSUE SPECIFICITY: Expressed by the venom duct.  
 CC -!- SIMILARITY: BELONGS TO THE O-SUPERFAMILY OF CONOTOXINS. OMEGA-TYPE  
 CC FAMILY.  
 CC PIR; B34115; B34115.  
 DR PIR; JH0701; JH0701.  
 DR HSSP; P05484; LMV1.  
 DR Presynaptic neurotoxin; Neurotoxin; Toxin; Calcium channel inhibitor;  
 KW Amidation.  
 FT DISULFID 1 16  
 FT DISULFID 8 20  
 FT DISULFID 15 25  
 FT MOD\_RES 25 25 AMIDATION.  
 SQ SEQUENCE 25 AA; 2626 MW; E4B9CE5EFAA3734D CRC64;  
 Query Match 69.4%; Score 120; DB 1; Length 25;  
 Best Local Similarity 76.0%; Pred. No. 1.9e-08;  
 Matches 19; Conservative 0; Mismatches 6; Indels 0; Gaps 0;  
 QY 1 CKGKGAKCSRLMYDCTGSCRRGKC 25  
 ||||| | | ||||| | |

Db 1 CKGKGASCHRTSYDCTGSCNRGKC 25  
 RESULT 5  
 CXO7\_CONCN STANDARD; PRT; 27 AA.  
 ID CXO7\_CONCN  
 AC P58916;  
 DT 15-JUN-2002 (Rel. 41, Created)  
 DT 15-JUN-2002 (Rel. 41, Last sequence update)  
 DT 15-JUN-2002 (Rel. 41, Last annotation update)  
 DE Omega-conotoxin CnVIIA.  
 OS *Conus consors* (Singed cone).  
 OC Eukaryota; Metazoa; Mollusca; Gastropoda; Caenogastropoda;  
 OC Neogastropoda; Conoidea; Conidae; Conus.  
 OX NCBI\_TaxID=101297;  
 RN [1]  
 RP SEQUENCE, SYNTHESIS, AND MASS SPECTROMETRY.  
 RC TISSUE-Venom;  
 RX PubMed=11724570;  
 RA Favreau P., Gilles N., Lamthanh H., Bournaud R., Shimahara T.,  
 RA Bouet F., Laboute P., Letourneux Y., Menez A., Molgo J., Le Gall F.;  
 RT "A new omega-conotoxin that targets N-type voltage-sensitive calcium  
 RT channels with unusual specificity.";  
 RL Biochemistry 40:14567-14575(2001).  
 CC -!- FUNCTION: Omega-conotoxins act at presynaptic membranes, they bind  
 CC and block voltage-sensitive calcium channels (VSCC). This toxin  
 CC blocks N-type calcium channels, but unexpectedly, does not show  
 CC any blocking activity at amphibian neuromuscular junction. Causes  
 CC shaking activity, and, at higher doses, causes mild tremors when  
 CC injected intracerebroventricularly into mice. Causes paralysis,  
 CC and, at higher doses, causes death when injected intramuscularly  
 CC into fish.  
 CC -!- SUBCELLULAR LOCATION: Secreted.  
 CC -!- TISSUE SPECIFICITY: Expressed by the venom duct.  
 CC -!- MASS SPECTROMETRY: MW=2847.74; METHOD=Electrospray.  
 CC -!- SIMILARITY: BELONGS TO THE O-SUPERFAMILY OF CONOTOXINS. OMEGA-TYPE  
 CC FAMILY.  
 CC Presynaptic neurotoxin; Neurotoxin; Toxin; Calcium channel inhibitor;  
 KW Hydroxylation; Amidation.  
 FT BINDING 13 13 ESSENTIAL FOR CALCIUM CHANNEL BINDING (BY  
 FT SIMILARITY).  
 FT DISULFID 1 16 BY SIMILARITY.  
 FT DISULFID 8 20 BY SIMILARITY.  
 FT DISULFID 15 27 BY SIMILARITY.  
 FT MOD\_RES 7 7 HYDROXYLATION.  
 FT MOD\_RES 27 27 AMIDATION.  
 SQ SEQUENCE 27 AA; 2839 MW; B9DEFD1491F2CB4A CRC64;  
 Query Match 66.5%; Score 115; DB 1; Length 27;  
 Best Local Similarity 74.1%; Pred. No. 7.9e-08;  
 Matches 20; Conservative 2; Mismatches 3; Indels 2; Gaps 1;  
 QY 1 CKGKGAKCSRLMYDCTGSCRS--GKC 25  
 ||||| | | ||||| | | | | |  
 Db 1 CKGKGAPCTRLMYDCCHGSCSSKGRK 27  
 RESULT 6  
 CXO3\_CONST STANDARD; PRT; 71 AA.  
 ID CXO3\_CONST  
 AC O9XK2;  
 DT 16-OCT-2001 (Rel. 40, Created)  
 DT 16-OCT-2001 (Rel. 40, Last sequence update)  
 DT 15-JUN-2002 (Rel. 41, Last annotation update)  
 DE Omega-type conotoxin SO3 precursor.  
 GN SO3.  
 OS *Conus striatus* (Striated cone).  
 OC Eukaryota; Metazoa; Mollusca; Gastropoda; Caenogastropoda;  
 OC Neogastropoda; Conoidea; Conidae; Conus.  
 OX NCBI\_TaxID=6493;  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE-Venom duct;

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RX MEDLINE=20037955; PubMed=10573284;
RA Lu B.-S., Yu F., Zhao D., Huang P.-T., Huang C.-F.;
RT "Conopeptides from Conus striatus and Conus textile by cDNA
RT cloning.";
RL Peptides 20:1139-1144(1999).
CC -!- FUNCTION: Omega-conotoxins act at presynaptic membranes, they bind
CC and block voltage-sensitive calcium channels (VSCC) (By
CC similarity).
CC -!- SUBCELLULAR LOCATION: Secreted (By similarity).
CC -!- TISSUE SPECIFICITY: Expressed by the venom duct.
CC -!- SIMILARITY: BELONGS TO THE O-SUPERFAMILY OF CONOTOXINS. OMEGA-TYPE
CC FAMILY.
CC
CC This SWISS-PROT entry is copyright. It is produced through a collaboration
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CC use by non-profit institutions as long as its content is in no way
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CC entities requires a license agreement (See http://www.isb-sib.ch/announce/
CC or send an email to license@isb-sib.ch).
CC -----
CC EMBL: AF146348; AAD31908.1; -
CC DR HSP: P05484; LMVI.
CC DR InterPro: IPR004214; Conotoxin.
CC DR Pfam: PF02950; Conotoxin; 1.
CC KW Presynaptic neurotoxin; Neurotoxin; Toxin; Calcium channel inhibitor;
CC Signal; Amidation.
CC FT SIGNAL 1 22 POTENTIAL.
CC FT PROPEP 23 44 POTENTIAL.
CC FT PEPTIDE 45 70 OMEGA-TYPE CONOTOXIN SO3.
CC FT DISULFID 46 61 BY SIMILARITY.
CC FT DISULFID 53 65 BY SIMILARITY.
CC FT DISULFID 60 70 BY SIMILARITY.
CC FT MOD_RES 70 70 AMIDATION (G-71 PROVIDE AMIDE GROUP)
CC FT (POTENTIAL).
CC SQ SEQUENCE 71 AA; 7628 MW; CE7070DCE3094D73 CRC64;
CC
CC Query Match 66.5%; Score 115; DB 1; Length 71;
CC Best Local Similarity 72.0%; Pred. No. 1.6e-07;
CC Matches 18; Conservative 2; Mismatches 5; Indels 0; Gaps 0;
CC
CC Y 1 CKGKGAKSRMLMYDCTGSCRSKGK 25
CC II | | | | | | | | | | | | | | | | | |
CC 46 CRAAGKPCSRRIAYNCTGSCRSKGK 70
CC
CC RESULT 7
CC CXOA_CONCT
CC ID CXOA_CONCT STANDARD; PRT; 71 AA.
CC AC P58917;
CC DT 15-JUN-2002 (Rel. 41, Created)
CC DT 15-JUN-2002 (Rel. 41, Last sequence update)
CC DE Omega-conotoxin CVIA precursor.
CC OS Conus catus (Cat cone).
CC OC Eukaryota; Metazoa; Mollusca; Gastropoda; Caenogastropoda;
CC OC Neogastropoda; Conoidea; Conidae; Conus.
CC OX NCBI_TaxID=101291;
CC RN [1]
CC RP SEQUENCE FROM N.A., SEQUENCE OF 46-70, AND SYNTHESIS.
CC RC TISSUE-Venom duct, and Venom;
CC RX PubMed=10938268;
CC RA Lewis R.J., Nielsen K.J., Craik D.J., Loughnan M.L., Adams D.A.,
CC Sharpe I.A., Luchian T., Adams D.J., Bond T., Thomas L., Jones A.,
CC Matheson J.-L., Drinkwater R., Andrews P.R., Alewood P.F.;
CC "Novel omega-conotoxins from Conus catus discriminate among neuronal
CC calcium channel subtypes.";
CC RT J. Biol. Chem. 275:35335-35344(2000).
CC RL -!- FUNCTION: Omega-conotoxins act at presynaptic membranes, they bind
CC and block voltage-sensitive calcium channels (VSCC) (By
CC similarity). This toxin blocks N-type calcium channels.
CC -!- SUBCELLULAR LOCATION: Secreted.
CC -!- TISSUE SPECIFICITY: Expressed by the venom duct.
CC -!- SIMILARITY: BELONGS TO THE O-SUPERFAMILY OF CONOTOXINS. OMEGA-TYPE
CC FAMILY.
CC KW Presynaptic neurotoxin; Neurotoxin; Toxin; Calcium channel inhibitor;
CC Amidation; Signal.
CC FT SIGNAL 1 22 POTENTIAL.
CC FT PROPEP 23 45 OMEGA-CONOTOXIN CVID.
CC FT PEPTIDE 46 72 BY SIMILARITY.
CC FT DISULFID 46 61 BY SIMILARITY.
CC FT DISULFID 53 65 BY SIMILARITY.
CC FT DISULFID 60 72 BY SIMILARITY.
CC FT MOD_RES 72 72 AMIDATION (G-73 PROVIDE AMIDE GROUP).
CC SQ SEQUENCE 73 AA; 7748 MW; C4CEBD30C77DAEC3 CRC64;
CC
CC Query Match 65.9%; Score 114; DB 1; Length 73;
CC Best Local Similarity 70.4%; Pred. No. 2.2e-07;
CC Matches 19; Conservative 3; Mismatches 3; Indels 2; Gaps 1;
CC
CC Y 1 CKGKGAKSRMLMYDCTGSCRS--GKC 25
CC II | | | | | | | | | | | | | | | | | |
CC 46 CKSKGAKSKMLMYDCCSGCSGTVGRC 72
CC
CC RESULT 9

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CC -!- SIMILARITY: BELONGS TO THE O-SUPERFAMILY OF CONOTOXINS. OMEGA-TYPE
CC FAMILY.
CC KW Presynaptic neurotoxin; Neurotoxin; Toxin; Calcium channel inhibitor;
CC Amidation; Signal.
CC FT SIGNAL 1 22 POTENTIAL.
CC FT PROPEP 23 45 OMEGA-CONOTOXIN CVIA.
CC FT PEPTIDE 46 70 BY SIMILARITY.
CC FT DISULFID 46 61 BY SIMILARITY.
CC FT DISULFID 53 65 BY SIMILARITY.
CC FT DISULFID 60 70 BY SIMILARITY.
CC FT MOD_RES 70 70 AMIDATION (G-71 PROVIDE AMIDE GROUP).
CC SQ SEQUENCE 71 AA; 7665 MW; B99D9C7C74996D01 CRC64;
CC
CC Query Match 66.5%; Score 115; DB 1; Length 71;
CC Best Local Similarity 72.0%; Pred. No. 1.6e-07;
CC Matches 18; Conservative 1; Mismatches 6; Indels 0; Gaps 0;
CC
CC Y 1 CKGKGAKSRMLMYDCTGSCRSKGK 25
CC II | | | | | | | | | | | | | | | | | |
CC 46 CKSTGASCRRTSYDCTGSCRSGRG 70
CC
CC RESULT 8
CC CXOD_CONCT
CC ID CXOD_CONCT STANDARD; PRT; 73 AA.
CC AC P58920;
CC DT 15-JUN-2002 (Rel. 41, Created)
CC DT 15-JUN-2002 (Rel. 41, Last sequence update)
CC DE Omega-conotoxin CVID precursor.
CC OS Conus catus (Cat cone).
CC OC Eukaryota; Metazoa; Mollusca; Gastropoda; Caenogastropoda;
CC OC Neogastropoda; Conoidea; Conidae; Conus.
CC OX NCBI_TaxID=101291;
CC RN [1]
CC RP SEQUENCE FROM N.A., SEQUENCE OF 46-72, SYNTHESIS, AND STRUCTURE BY
CC NMR.
CC RC TISSUE-Venom duct, and Venom;
CC RX PubMed=10938268;
CC RA Lewis R.J., Nielsen K.J., Craik D.J., Loughnan M.L., Adams D.A.,
CC Sharpe I.A., Luchian T., Adams D.J., Bond T., Thomas L., Jones A.,
CC Matheson J.-L., Drinkwater R., Andrews P.R., Alewood P.F.;
CC "Novel omega-conotoxins from Conus catus discriminate among neuronal
CC calcium channel subtypes.";
CC RT J. Biol. Chem. 275:35335-35344(2000).
CC RL -!- FUNCTION: Omega-conotoxins act at presynaptic membranes, they bind
CC and block voltage-sensitive calcium channels (VSCC) (By
CC similarity). This toxin blocks N-type calcium channels.
CC -!- SUBCELLULAR LOCATION: Secreted.
CC -!- TISSUE SPECIFICITY: Expressed by the venom duct.
CC -!- SIMILARITY: BELONGS TO THE O-SUPERFAMILY OF CONOTOXINS. OMEGA-TYPE
CC FAMILY.
CC KW Presynaptic neurotoxin; Neurotoxin; Toxin; Calcium channel inhibitor;
CC Amidation; Signal.
CC FT SIGNAL 1 22 POTENTIAL.
CC FT PROPEP 23 45 OMEGA-CONOTOXIN CVID.
CC FT PEPTIDE 46 72 BY SIMILARITY.
CC FT DISULFID 46 61 BY SIMILARITY.
CC FT DISULFID 53 65 BY SIMILARITY.
CC FT DISULFID 60 72 BY SIMILARITY.
CC FT MOD_RES 72 72 AMIDATION (G-73 PROVIDE AMIDE GROUP).
CC SQ SEQUENCE 73 AA; 7748 MW; C4CEBD30C77DAEC3 CRC64;
CC
CC Query Match 65.9%; Score 114; DB 1; Length 73;
CC Best Local Similarity 70.4%; Pred. No. 2.2e-07;
CC Matches 19; Conservative 3; Mismatches 3; Indels 2; Gaps 1;
CC
CC Y 1 CKGKGAKSRMLMYDCTGSCRS--GKC 25
CC II | | | | | | | | | | | | | | | | | |
CC 46 CKSKGAKSKMLMYDCCSGCSGTVGRC 72
CC
CC RESULT 9

```

CXOC\_CONMA  
ID CXOC\_CONMA STANDARD; PRT; 29 AA.  
AC P37300;  
DT 01-OCT-1994 (Rel. 30, Created)  
DT 01-OCT-1994 (Rel. 30, Last sequence update)  
DT 15-JUN-2002 (Rel. 41, Last annotation update)  
DE Omega-conotoxin MVIIC precursor (SNX-230) (Fragment).  
OS Conus magus (Magus cone).  
OC Eukaryota; Metazoa; Mollusca; Gastropoda; Caenogastropoda;  
OC Neogastropoda; Conoidea; Conidae; Conus.  
OX NCBI\_TaxID=6492;  
RN [1]  
RN SEQUENCE FROM N.A., AND SYNTHESIS.  
RX MEDLINE=92337922; PubMed=1352986;  
RA Hillyard D.R., Monje V.D., Mintz I.M., Bean B.P., Nadasdi L.,  
RA Ramachandran J., Miljanich G.P., Azimi-Zoonooz A., McIntosh J.M.,  
RA Cruz L.J., Imperial J.S., Olivera B.M.;  
RT "A new Conus peptide ligand for mammalian presynaptic Ca2+ channels.";  
RN Neuron 9:69-77(1992).  
RN [2]  
RN STRUCTURE BY NMR.  
RX MEDLINE=95248539; PubMed=7731037;  
RA Farr-Jones S., Miljanich G.P., Nadasdi L., Ramachandran J.,  
RA Basus V.J.;  
RT "Solution structure of omega-conotoxin MVIIC, a high affinity ligand  
of P-type calcium channels, using 1H NMR spectroscopy and complete  
relaxation matrix analysis.";  
RT J. Mol. Biol. 248:106-124(1995).  
RN [3]  
RN STRUCTURE BY NMR.  
RX PubMed=10373375;  
RA Nielsen K.J., Adams D., Thomas L., Bond T., Alewood P.F., Craik D.J.,  
RA Lewis R.J.;  
RT "Structure-activity relationships of omega-conotoxins MVIIC and  
RT 14 loop splice hybrids at N and P/Q-type calcium channels.";  
RL J. Mol. Biol. 289:1405-1421(1999).  
RN [4]  
RN MUTAGENESIS OF TYR-15.  
RX PubMed=7677735;  
RA Kim J.I., Takahashi M., Martin-Moutot N., Seagar M.J., Ohtake A.,  
RA Sato K.;  
RT "Tyr13 is essential for the binding of omega-conotoxin MVIIC to the  
RT P/Q-type calcium channel.";  
RL Biochem. Biophys. Res. Commun. 214:305-309(1995).  
CC -1- FUNCTION: Omega-conotoxins act at presynaptic membranes, they bind  
CC and block voltage-sensitive calcium channels (VSCC). This toxin  
CC blocks N-type calcium channels as well as types of high-threshold  
CC voltage-gated calcium channels resistant to both dihydropyridines  
CC and omega-conotoxin GVIA.  
CC -1- SUBCELLULAR LOCATION: Secreted.  
CC -1- TISSUE SPECIFICITY: Expressed by the venom duct.  
CC -1- SIMILARITY: BELONGS TO THE O-SUPERFAMILY OF CONOTOXINS. OMEGA-TYPE  
CC FAMILY.  
CC  
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CC  
CC EMBL; S40826; AAB22674.1; -.  
DR PIR; JH0699; JH0699.  
DR PDB; 1OMN; 01-DEC-95.  
DR PDB; 1CNN; 31-MAY-00.  
KW Presynaptic neurotoxin; Neurotoxin; Toxin; Calcium channel inhibitor;  
KW Hydroxylation; Amidation; 3D-structure.  
FT NON\_TER 1 1  
FT PROPEP <1 2  
FT PEPTIDE 3 28 OMEGA-CONOTOXIN MVIIC.  
FT BINDING 15 15 ESSENTIAL FOR CALCIUM CHANNEL BINDING.  
FT DISULFID 3 18

FT DISULFID 10 22  
FT DISULFID 17 28  
FT MOD\_RES 9 9 HYDROXYLATION (PROBABLE).  
FT MOD\_RES 28 28 AMIDATION (G-29 PROVIDE AMIDE GROUP).  
FT MUTAGEN 15 15 Y->A: HIGH DECREASE IN BINDING.  
SQ SEQUENCE 29 AA; 3071 MW; AC7A68948474728A CRC64;  
Query Match 65.0%; Score 112.5; DB 1; Length 29;  
Best Local Similarity 73.1%; Pred. No. 1.7e-07;  
Matches 19; Conservative 2; Mismatches 4; Indels 1; Gaps 1;  
QY 1 CKGKGAKCSRLMYDCTGSC-RSGKC 25  
Db 3 CKGKGAPCRKTMVDCCSGSGRRGKC 28  
RESULT 10  
CXOD\_CONMA STANDARD; PRT; 29 AA.  
ID CXOD\_CONMA  
AC Q26350;  
DT 15-DEC-1998 (Rel. 37, Created)  
DT 15-DEC-1998 (Rel. 37, Last sequence update)  
DT 15-JUN-2002 (Rel. 41, Last annotation update)  
DE Omega-conotoxin MVIID precursor (SNX-238) (Fragment).  
OS Conus magus (Magus cone).  
OC Eukaryota; Metazoa; Mollusca; Gastropoda; Caenogastropoda;  
OC Neogastropoda; Conoidea; Conidae; Conus.  
OX NCBI\_TaxID=6492;  
RN [1]  
RN SEQUENCE FROM N.A.  
RX MEDLINE=94150815; PubMed=8107968;  
RA Monje V.D., Haack J.A., Naisbitt S.R., Miljanich G., Ramachandran J.,  
RA Nadasdi L., Olivera B.M., Hillyard D.R., Gray W.R.;  
RT "A new Conus peptide ligand for Ca channel subtypes.";  
RL Neuropharmacology 32:1141-1149(1993).  
RN [2]  
RN STRUCTURE BY NMR.  
RX PubMed=9920728;  
RA Civera C., Vazquez A., Sevilla J.M., Bruix M., Gago F., Garcia A.G.,  
RA Sevilla P.;  
RT "Solution structure determination by two-dimensional 1H NMR of  
RT omega-conotoxin MVIID, a calcium channel blocker peptide.";  
RL Biochem. Biophys. Res. Commun. 254:32-35(1999).  
CC -1- FUNCTION: Omega-conotoxins act at presynaptic membranes, they bind  
CC and block voltage-sensitive calcium channels (VSCC). This toxin  
CC blocks channels of the N-type as well as other types.  
CC -1- SUBCELLULAR LOCATION: Secreted.  
CC -1- TISSUE SPECIFICITY: Expressed by the venom duct.  
CC -1- SIMILARITY: BELONGS TO THE O-SUPERFAMILY OF CONOTOXINS. OMEGA-TYPE  
CC FAMILY.  
CC  
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CC  
CC EMBL; S69322; AAB29902.1; -.  
DR HSSP; P05484; IMVI.  
KW Presynaptic neurotoxin; Neurotoxin; Toxin; Calcium channel inhibitor;  
KW Amidation.  
FT NON\_TER 1 1  
FT PROPEP <1 3  
FT PEPTIDE 4 28 OMEGA-CONOTOXIN MVIID.  
FT DISULFID 4 19  
FT DISULFID 11 23  
FT DISULFID 18 28  
FT MOD\_RES 28 28  
SQ SEQUENCE 29 AA; 3104 MW; 9E04B2EA3779CB22 CRC64;  
Query Match 60.1%; Score 104; DB 1; Length 29;

[illegible]

SEQUENCE.  
RX MEDLINE=94062828; PubMed=8243463;  
RA Mackay E.A., Overnell J., Dunbar B., Davidson I., Hunziker P.E.,  
RT Kaegi J.H.R., Fothergill J.E.;  
RT "Complete amino acid sequences of five dimeric and four monomeric  
forms of metallothionein from the edible mussel *Mytilus edulis*.";  
RL Eur. J. Biochem. 218:183-194(1993).  
RN [2]  
RP SEQUENCE FROM N.A.  
RC TISSUE=Digestive gland;  
RX MEDLINE=99206055; PubMed=10190057;  
RA Barsyte D., White K.N., Lovejoy D.A.;  
RT "Cloning and characterization of metallothionein cDNAs in the mussel  
*Mytilus edulis* L. digestive gland.";  
RL Comp. Biochem. Physiol. 122C:287-296(1999).  
CC -!- FUNCTION: THE METALLOTHIONEINS ARE INVOLVED IN THE CELLULAR  
SEQUESTRATION OF TOXIC METAL IONS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- INDUCTION: BY CADMIUM.  
CC -!- SIMILARITY: BELONGS TO THE METALLOTHIONEIN SUPERFAMILY; FAMILY 2.  
CC -----  
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CC -----  
DR EMBL; AJ005453; CAA06550.1; -;  
DR PIR; S39417; S39417.  
DR InterPro; IPR003019; Metallthion.  
DR Pfam; PF00131; metalthio; 1.  
DR PRINTS; PR00875; MTMOLLUSC.  
KW Metal-binding; Metal-thiolate cluster; Cadmium.  
FT INIT\_MET 0 0  
FT CONFLICT 21 21 D -> E (IN REF. 1).  
SQ SEQUENCE 72 AA; 7022 MW; 7FA99D945C35DE19 CRC64;  
  
Query Match 37.0%; Score 64; DB 1; Length 72;  
Best Local Similarity 50.0%; Pred. No. 0.17;  
Matches 14; Conservative 1; Mismatches 11; Indels 2; Gaps 2;  
  
QY 1 CKGKAGKCSRLMYDC-CTGSCRSK-CT 26  
DB 31 CSAGDCKSCGCKVVKCGSGCEGKGT 58  
  
RESULT 14  
MT3\_RAT  
ID MT3\_RAT STANDARD; PRT; 66 AA.  
AC P37361;  
DT 01-OCT-1994 (Rel. 30, Created)  
DT 01-OCT-1994 (Rel. 30, Last sequence update)  
DT 15-JUN-2002 (Rel. 41, Last annotation update)  
DE Metallothionein-III (MT-III) (Growth inhibitory factor) (GIF).  
GN MT3.  
OS Rattus norvegicus (Rat).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.  
OX NCBI\_TaxID=10116;  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE=94018480; PubMed=8412560;  
RA Kobayashi H., Uchida Y., Ihara Y., Nakajima K., Kohsaka S.,  
RA Miyatake T., Tsuji S.;  
RT "Molecular cloning of rat growth inhibitory factor cDNA and the  
expression in the central nervous system.";  
RL Brain Res. Mol. Brain Res. 19:188-194(1993).  
RN [2]  
RP SEQUENCE FROM N.A.  
RC TISSUE=Glial tumor;

RA Amoureux M.C., Rethsaus E., Wurch T., Colpaert F.C., Pauwels P.J.;  
RL Submitted (JUL-1995) to the EMBL/GenBank/DBJ databases.  
RN [3]  
RP SEQUENCE FROM N.A.  
RC STRAIN=Sprague-Dawley;  
RA Chapman G.A., Killie P.;  
RL Submitted (SEP-1996) to the EMBL/GenBank/DBJ databases.  
CC -!- FUNCTION: BINDS HEAVY METALS. CONTAINS ZINC AND COPPER ATOMS AND  
ONLY A NEGLIGIBLE AMOUNT OF CADMIUM (BY SIMILARITY).  
CC -!- TISSUE SPECIFICITY: BRAIN.  
CC -!- SIMILARITY: BELONGS TO THE METALLOTHIONEIN SUPERFAMILY; FAMILY 1.  
CC -----  
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or send an email to [license@isb-sib.ch](mailto:license@isb-sib.ch)).  
CC -----  
DR EMBL; S65838; AAB28366.1; -;  
DR EMBL; X89603; CAA61762.1; -;  
DR EMBL; Y08235; CAA69404.1; -;  
DR HSP; P28184; L319.  
DR InterPro; IPR003019; Metallthion.  
DR Pfam; PF00131; metalthio; 1.  
DR PRINTS; PR00860; MTVERTERRATE.  
DR PROSITE; PS00203; METALLOTHIONEIN\_VRT; 1.  
KW Metal-binding; Metal-thiolate cluster; Zinc; Copper; Acetylation.  
FT MOD\_RES 1 1 ACETYLATION (BY SIMILARITY).  
FT DOMAIN 1 30 BETA.  
FT DOMAIN 31 66 ALPHA.  
FT METAL 6 6 CLUSTER B (BY SIMILARITY).  
FT METAL 8 8 CLUSTER B (BY SIMILARITY).  
FT METAL 14 14 CLUSTER B (BY SIMILARITY).  
FT METAL 16 16 CLUSTER B (BY SIMILARITY).  
FT METAL 20 20 CLUSTER B (BY SIMILARITY).  
FT METAL 22 22 CLUSTER B (BY SIMILARITY).  
FT METAL 25 25 CLUSTER B (BY SIMILARITY).  
FT METAL 27 27 CLUSTER B (BY SIMILARITY).  
FT METAL 30 30 CLUSTER B (BY SIMILARITY).  
FT METAL 34 34 CLUSTER A (BY SIMILARITY).  
FT METAL 35 35 CLUSTER A (BY SIMILARITY).  
FT METAL 37 37 CLUSTER A (BY SIMILARITY).  
FT METAL 38 38 CLUSTER A (BY SIMILARITY).  
FT METAL 42 42 CLUSTER A (BY SIMILARITY).  
FT METAL 45 45 CLUSTER A (BY SIMILARITY).  
FT METAL 49 49 CLUSTER A (BY SIMILARITY).  
FT METAL 51 51 CLUSTER A (BY SIMILARITY).  
FT METAL 62 62 CLUSTER A (BY SIMILARITY).  
FT METAL 64 64 CLUSTER A (BY SIMILARITY).  
FT METAL 65 65 CLUSTER A (BY SIMILARITY).  
SQ SEQUENCE 66 AA; 6809 MW; BE7538E564EBF8 CRC64;  
  
Query Match 35.0%; Score 60.5; DB 1; Length 66;  
Best Local Similarity 40.0%; Pred. No. 0.42;  
Matches 12; Conservative 5; Mismatches 10; Indels 3; Gaps 2;  
  
QY 1 CKGKAGKCSRLMYDCCTGSCRSK--KCTRN 28  
DB 20 CKCKGCKCTNCKKSCCS-CCPAGCEKCAKD 48  
  
RESULT 15  
MT3\_MOUSE  
ID MT3\_MOUSE STANDARD; PRT; 68 AA.  
AC P28184;  
DT 01-DEC-1992 (Rel. 24, Created)  
DT 01-DEC-1992 (Rel. 24, Last sequence update)  
DT 15-JUN-2002 (Rel. 41, Last annotation update)  
DE Metallothionein-III (MT-III) (Growth inhibitory factor) (GIF).  
GN MT3.

